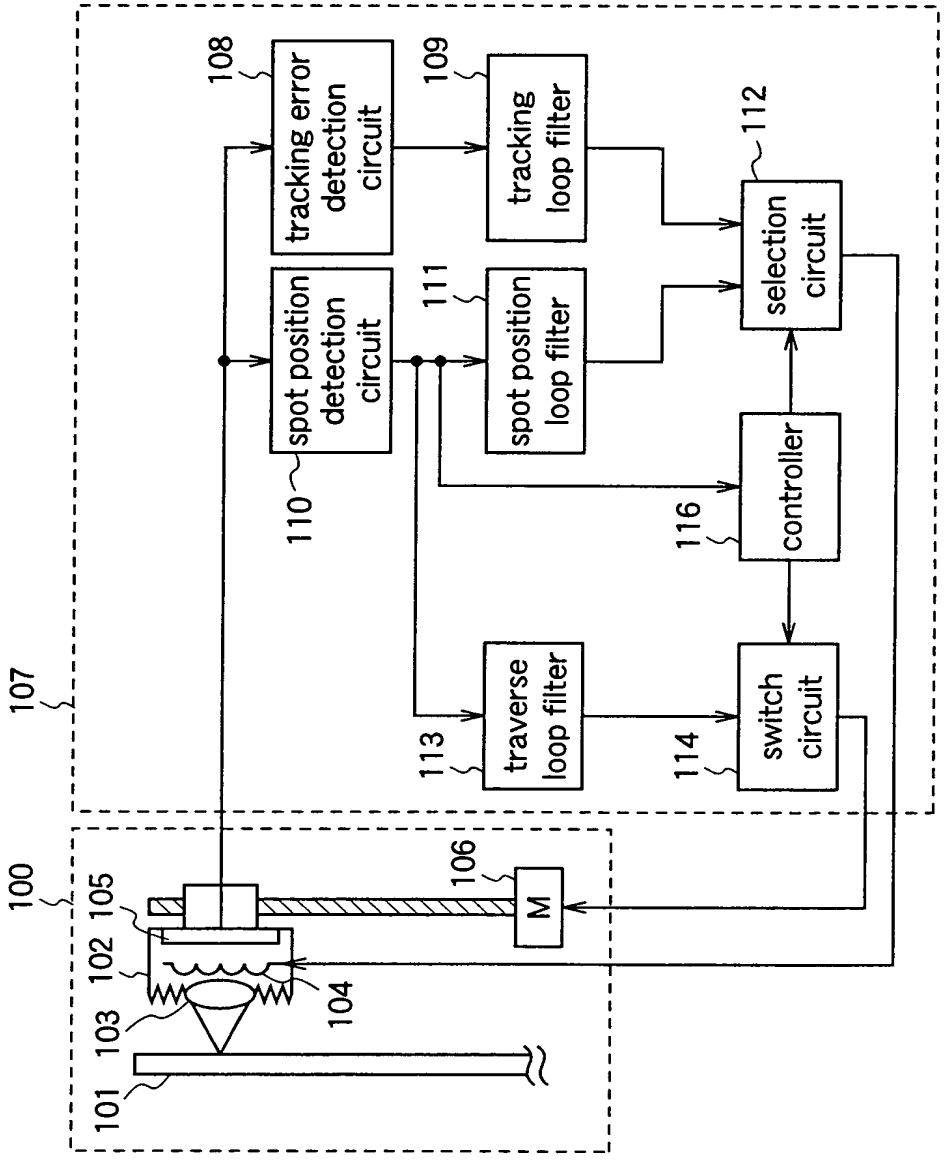

100
101
102
103
104
105
106
M
107
108
tracking error detection circuit
109
tracking loop filter
110
spot position detection circuit
111
spot position loop filter
112
selection circuit
113
traverse loop filter
114
switch circuit
116
controller

Fig.1

Fig.2

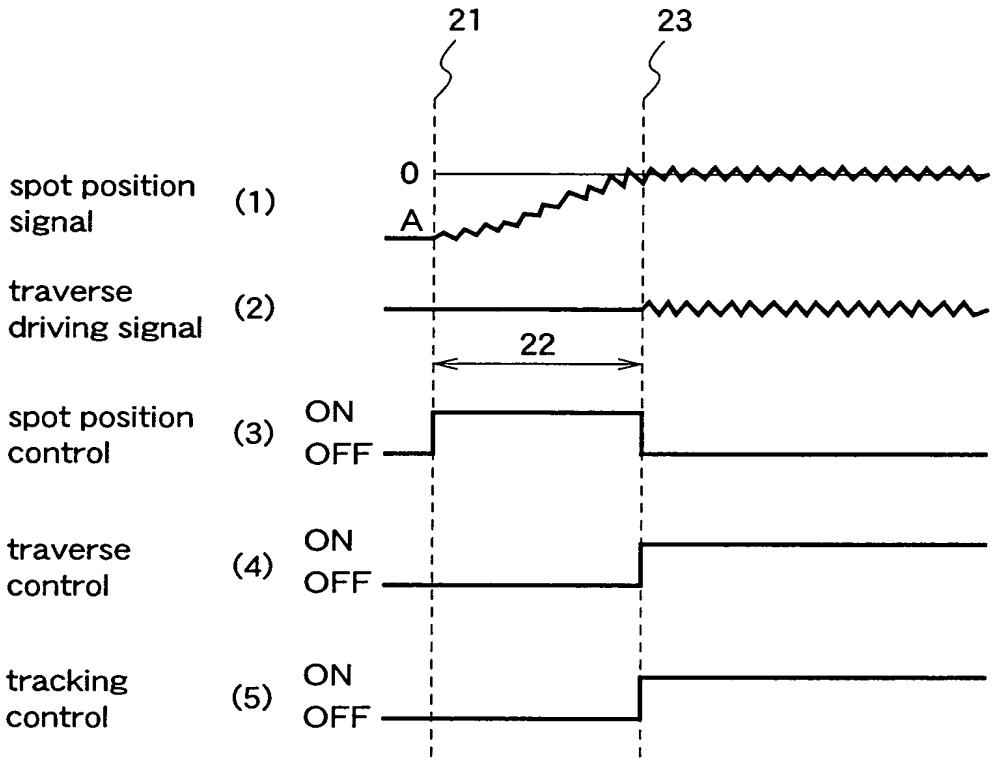

21
23
spot position signal
(1)
0
A
traverse driving signal
(2)
22
spot position control
(3)
ON
OFF
traverse control
(4)
ON
OFF
tracking control
(5)
ON
OFF

Fig.3

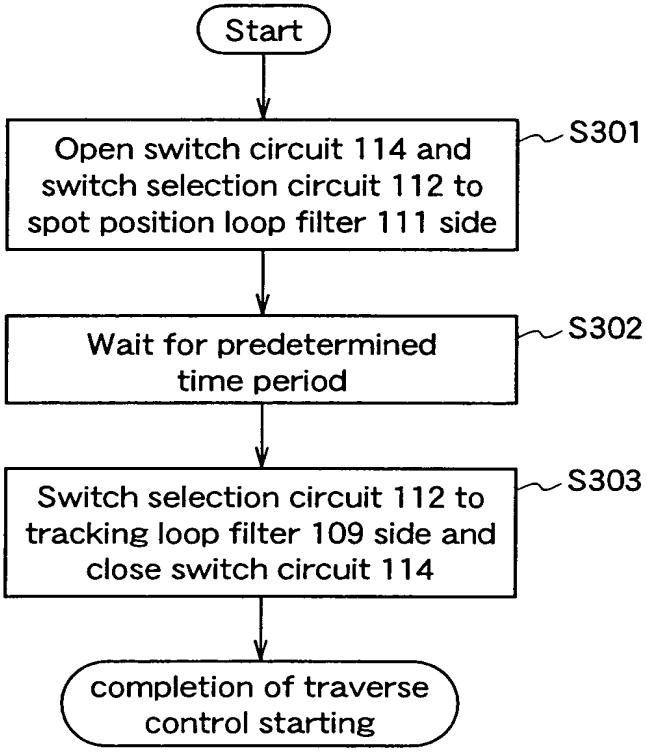

Start
Open switch circuit 114 and switch selection circuit 112 to spot position loop filter 111 side
S301
Wait for predetermined time period
S302
Switch selection circuit 112 to tracking loop filter 109 side and close switch circuit 114
S303
completion of traverse control starting

Fig.4

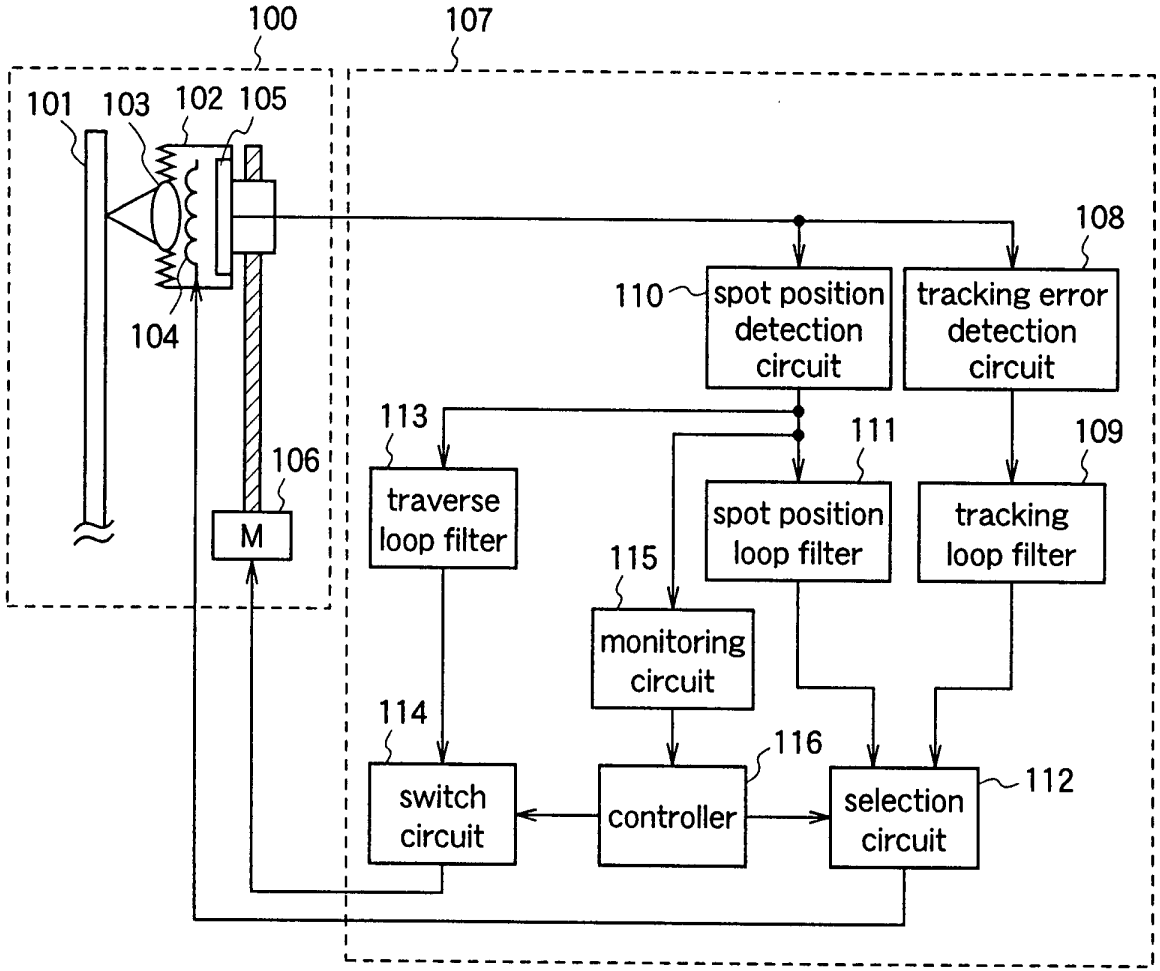

100
107
101
103
102
105
104
106
M
108
110
spot position detection circuit
tracking error detection circuit
113
111
109
traverse loop filter
spot position loop filter
tracking loop filter
115
monitoring circuit
114
116
112
switch circuit
controller
selection circuit

Fig.5

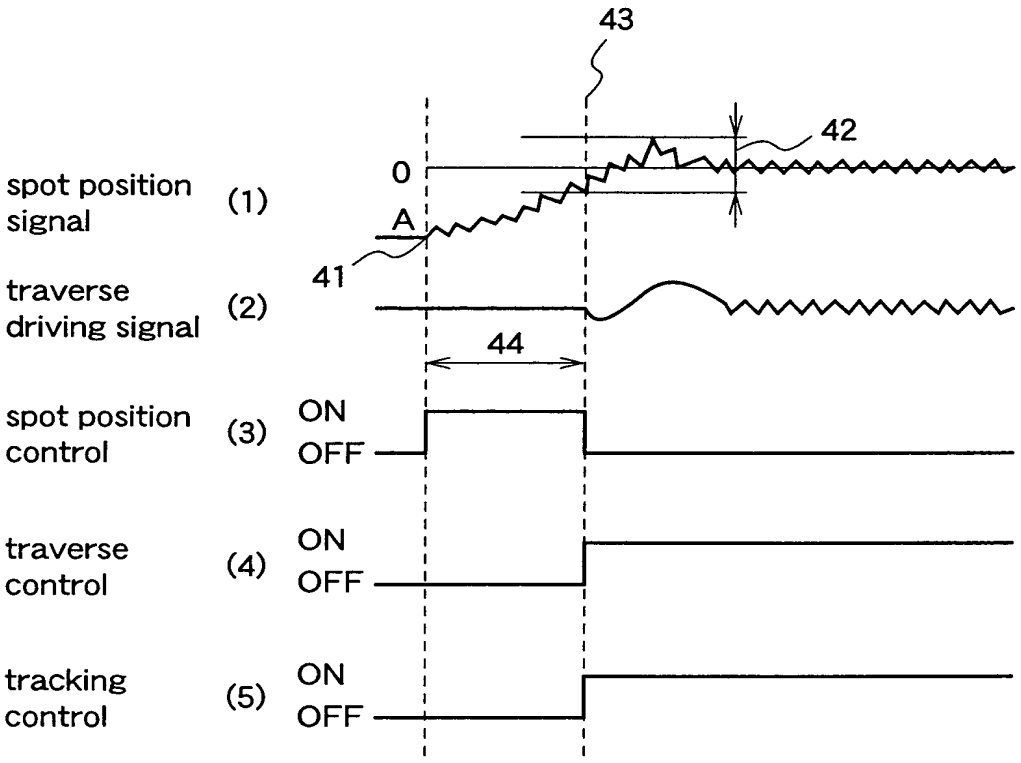

43
42
0
A
41
spot position signal
(1)
traverse driving signal
(2)
44
spot position control
(3)
ON
OFF
traverse control
(4)
ON
OFF
tracking control
(5)
ON
OFF

Fig.6

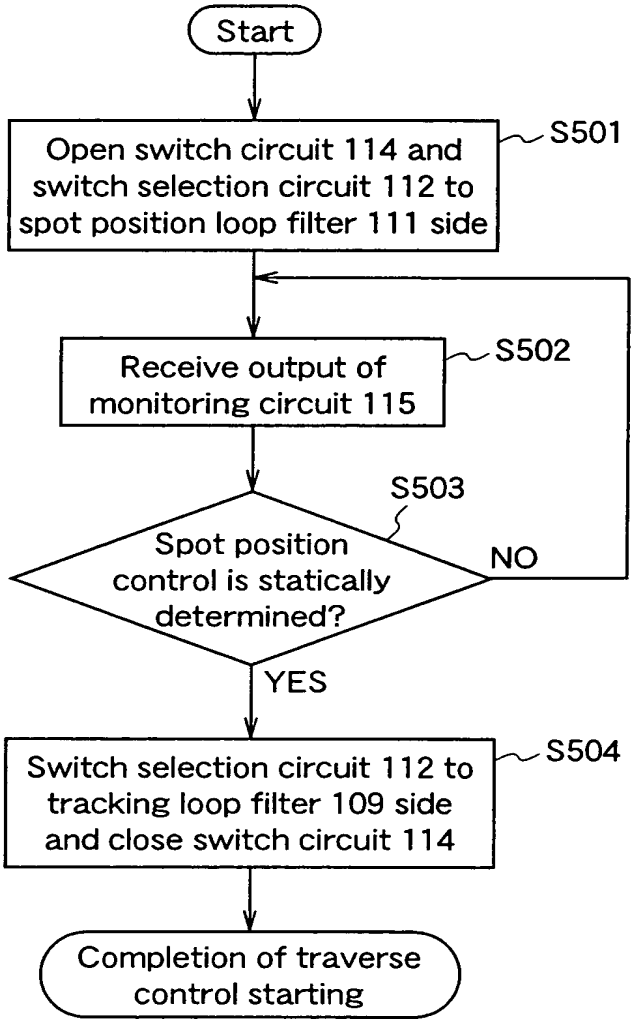

Start
Open switch circuit 114 and switch selection circuit 112 to spot position loop filter 111 side
S501
Receive output of monitoring circuit 115
S502
S503
Spot position control is statically determined?
NO
YES
Switch selection circuit 112 to tracking loop filter 109 side and close switch circuit 114
S504
Completion of traverse control starting

Fig.7

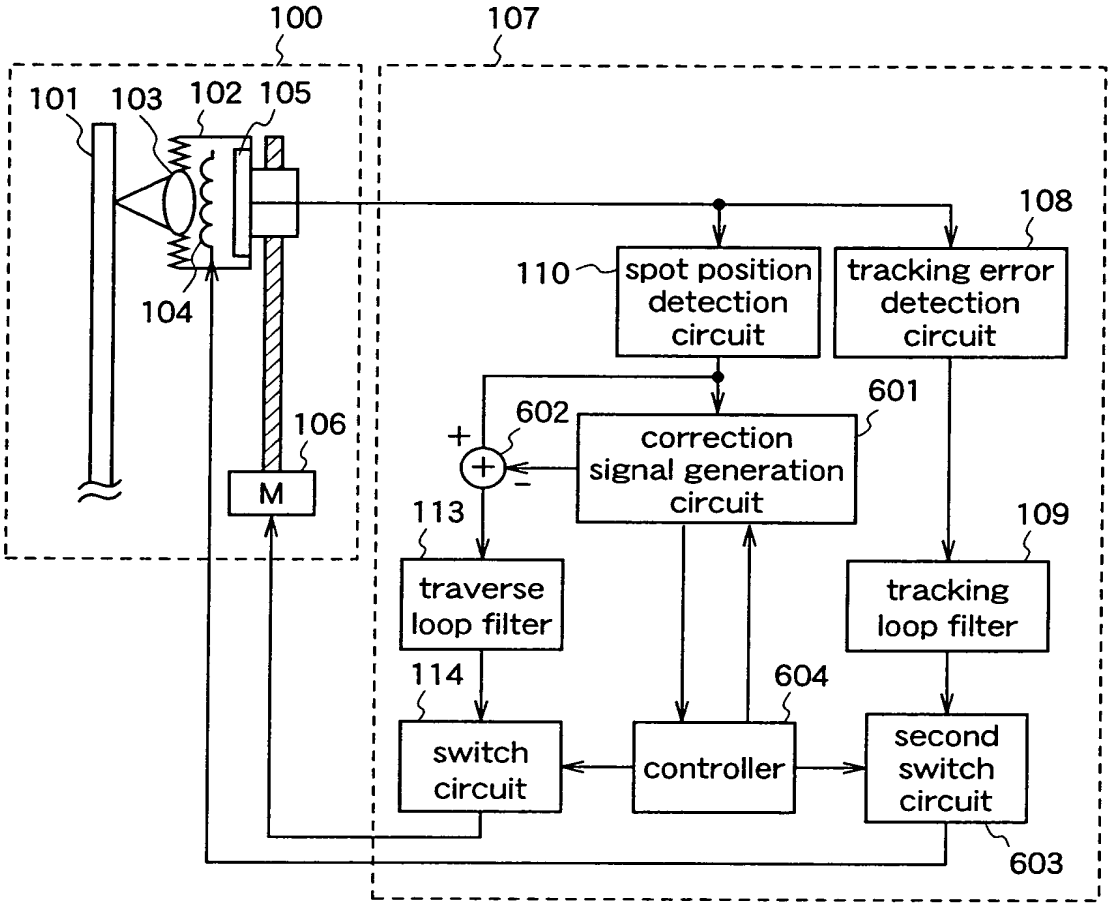

100
107
101
103
102
105
104
106
M
108
110
spot position detection circuit
tracking error detection circuit
601
602
correction signal generation circuit
113
109
traverse loop filter
tracking loop filter
114
604
switch circuit
controller
second switch circuit
603

Fig.8

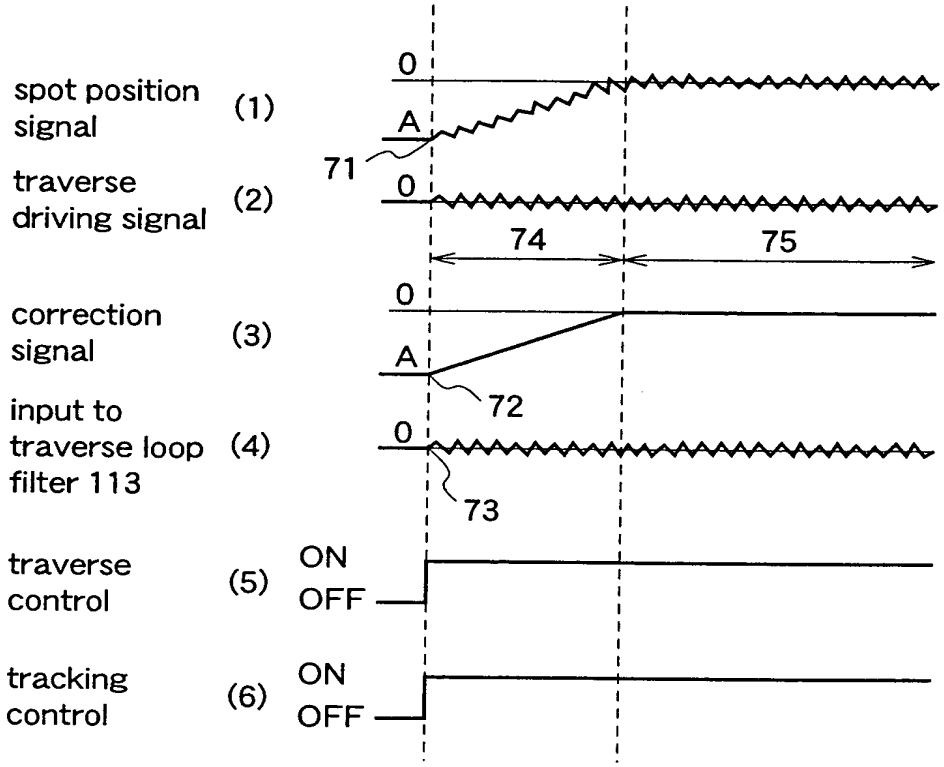

spot position signal
(1)
traverse driving signal
(2)
correction signal
(3)
input to traverse loop filter 113
(4)
traverse control
(5)
tracking control
(6)
0
A
71
0
74
75
0
A
72
0
73
ON
OFF
ON
OFF

Fig.9

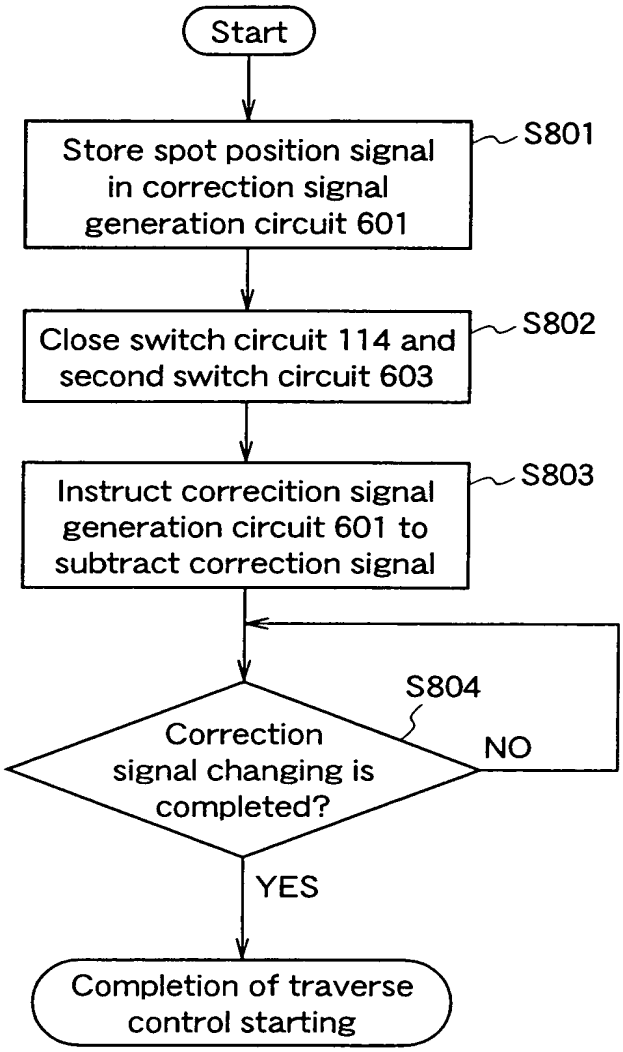

Start
Store spot position signal in correction signal generation circuit 601
S801
Close switch circuit 114 and second switch circuit 603
S802
Instruct correcition signal generation circuit 601 to subtract correction signal
S803
S804
Correction signal changing is completed?
NO
YES
Completion of traverse control starting

Fig.10

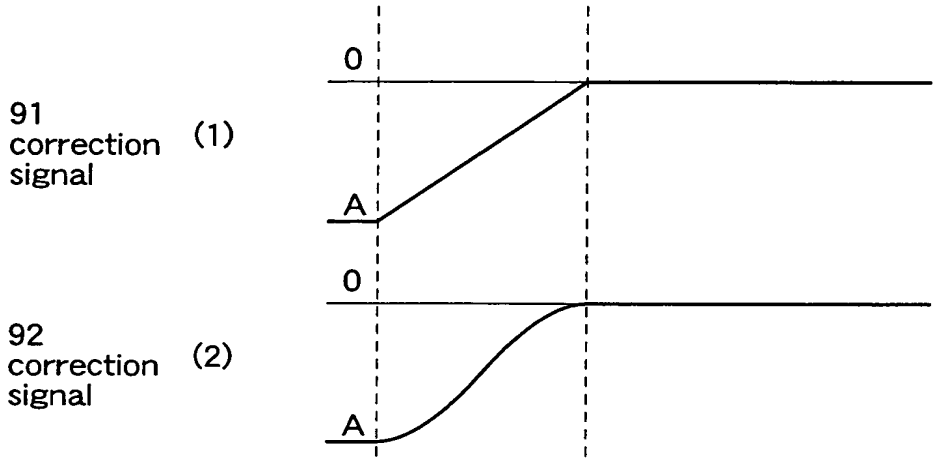


Fig.11

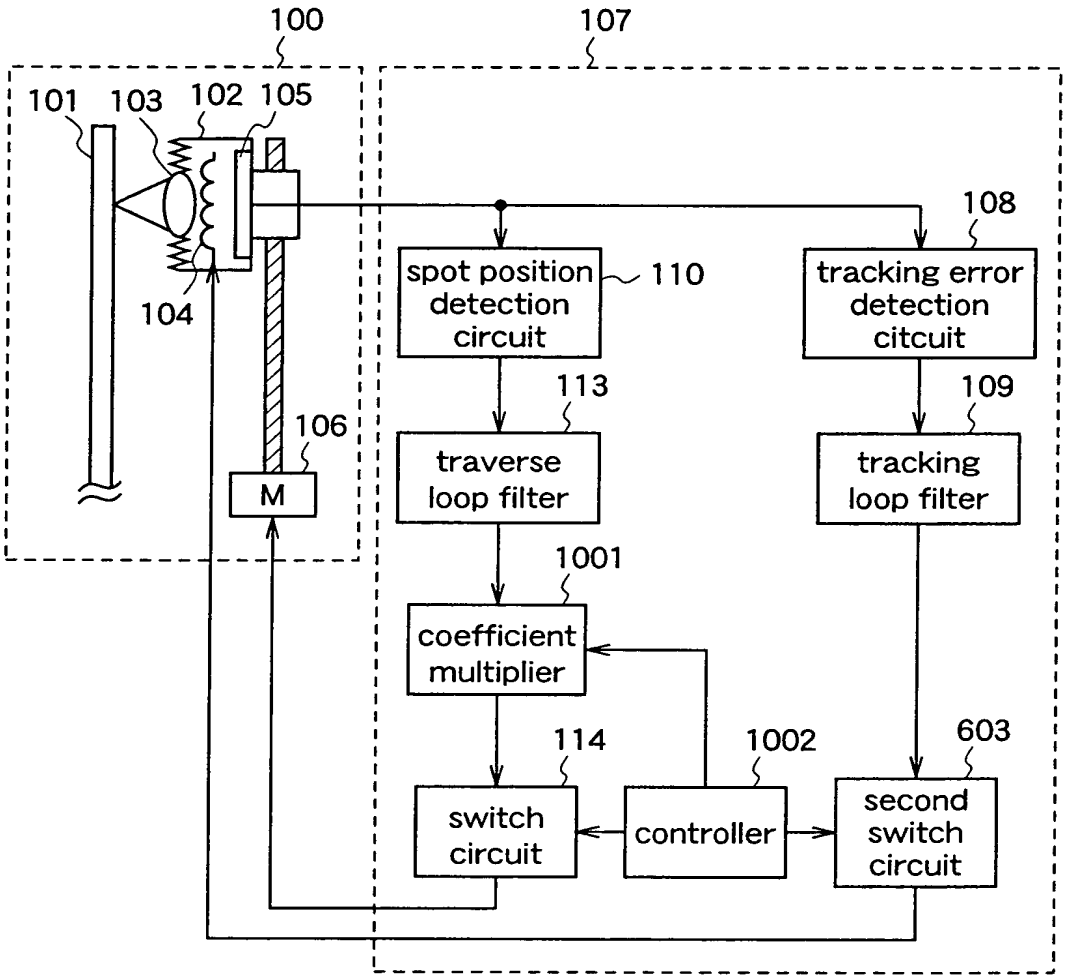

100
107
101
103
102
105
104
106
M
108
spot position detection circuit
110
tracking error detection citcuit
113
109
traverse loop filter
tracking loop filter
1001
coefficient multiplier
114
1002
603
switch circuit
controller
second switch circuit

Fig.12

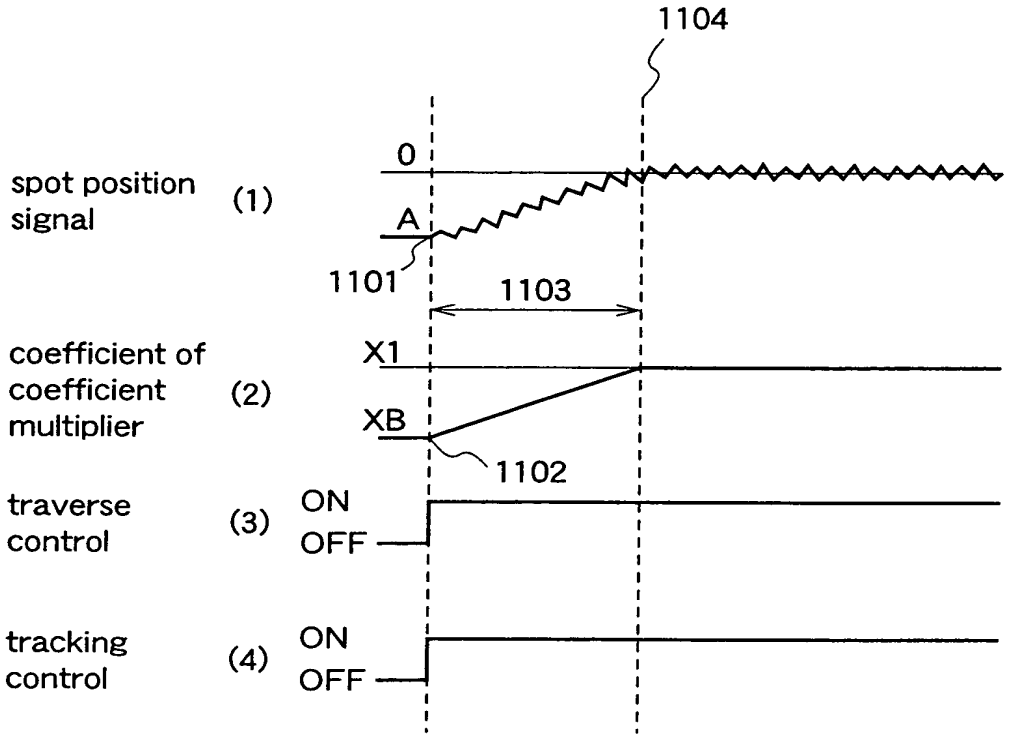

1104
spot position signal
(1)
0
A
1101
1103
coefficient of coefficient multiplier
(2)
X1
XB
1102
traverse control
(3)
ON
OFF
tracking control
(4)
ON
OFF

Fig.13

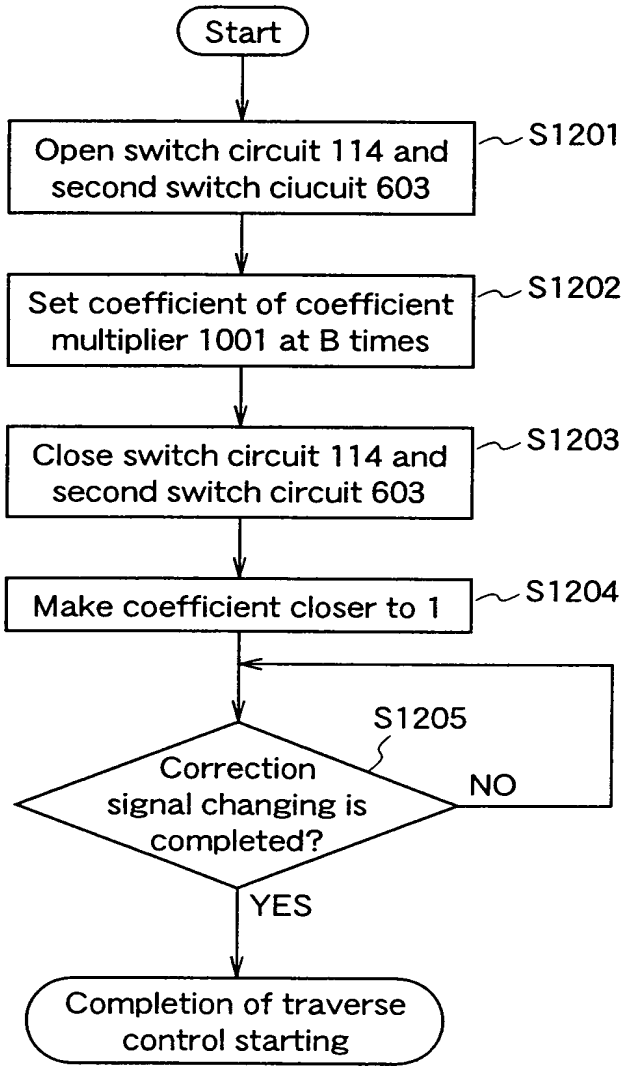

Start
Open switch circuit 114 and second switch ciucuit 603
S1201
Set coefficient of coefficient multiplier 1001 at B times
S1202
Close switch circuit 114 and second switch circuit 603
S1203
Make coefficient closer to 1
S1204
S1205
Correction signal changing is completed?
NO
YES
Completion of traverse control starting

Fig.14 Prior Art

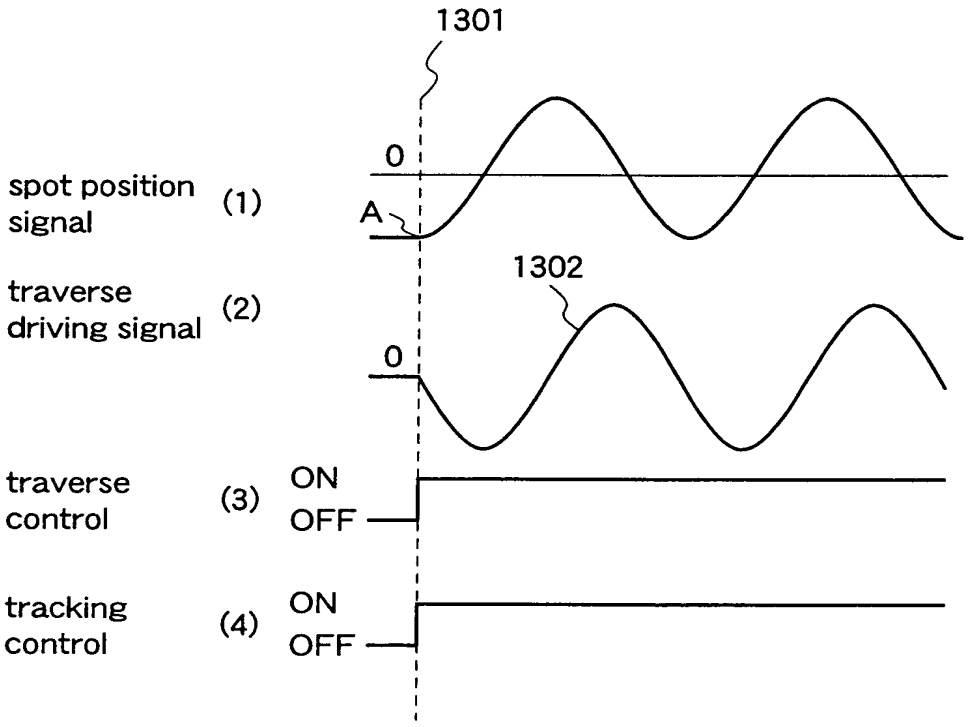


Fig.15 (a)
open-loop gain characteristics without spot position loop filter 111

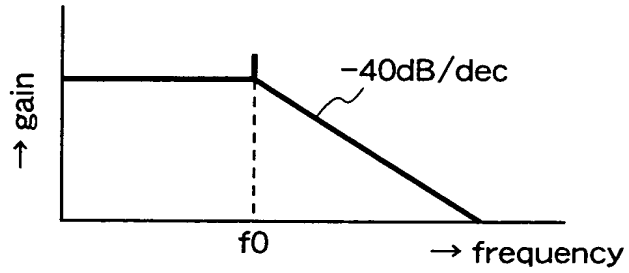


Fig.15 (b)
gain characteristics of spot position loop filter 111

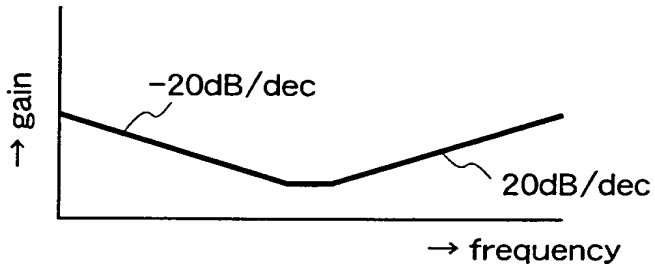
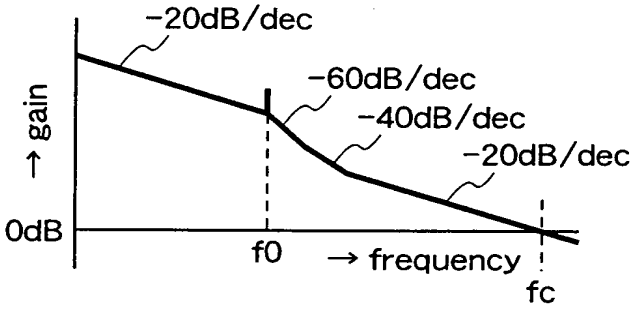


Fig.15 (c)
open-loop characteristics of whole spot position control



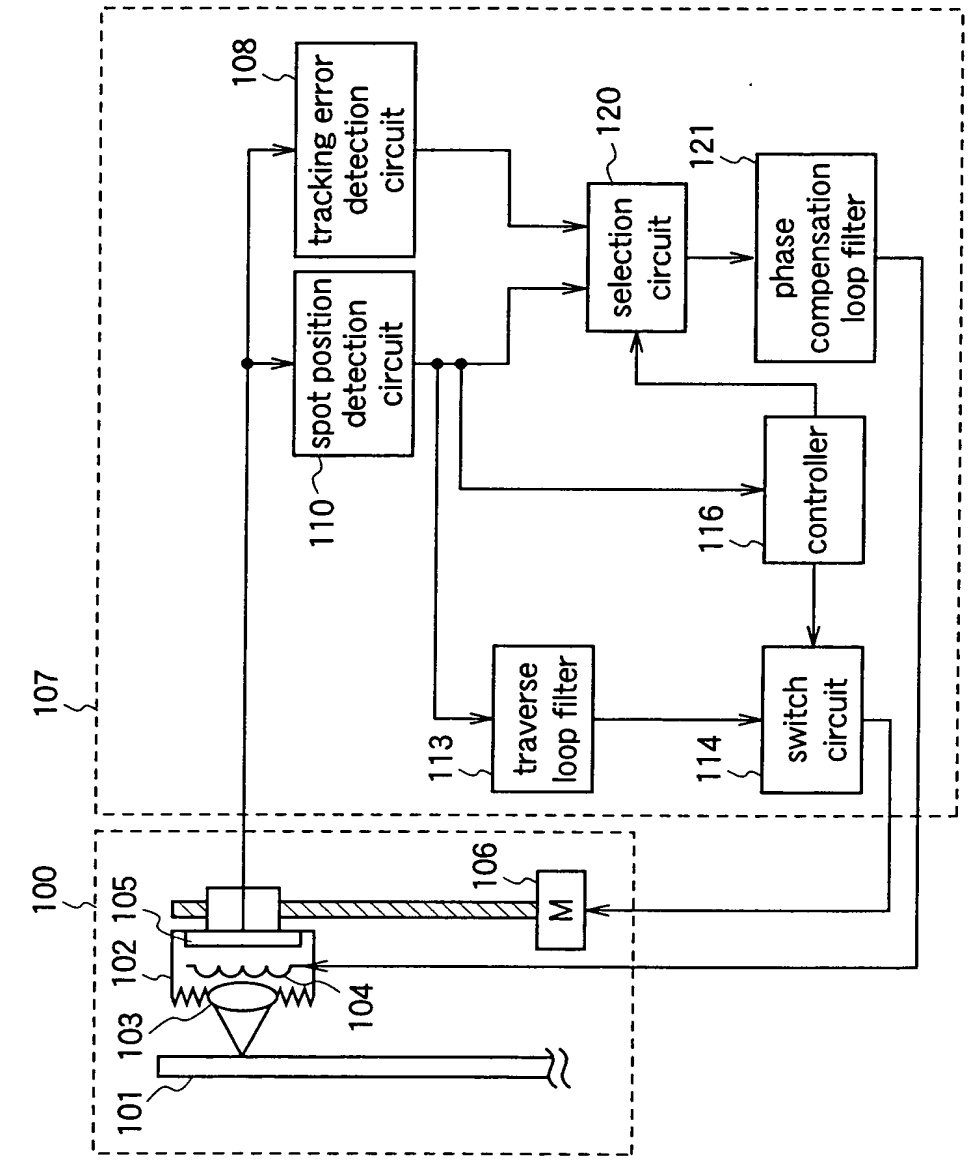

100
101
102
103
104
105
106
M
107
108
tracking error detection circuit
110
spot position detection circuit
113
traverse loop filter
114
switch circuit
116
controller
120
selection circuit
121
phase compensation loop filter

Fig.16

Fig.17 (a)
open-loop gain characteristics without spot position loop filter 111

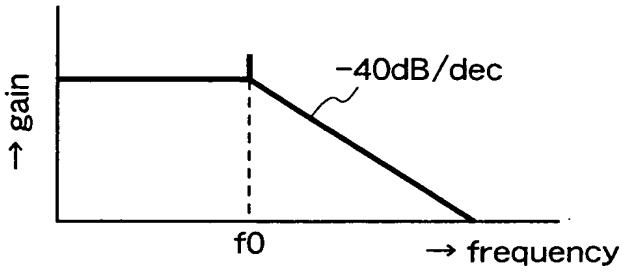


Fig.17 (b)
gain characteristics of spot position loop filter 111

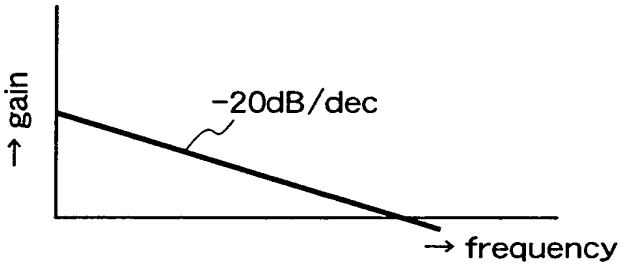


Fig.17 (c)
open-loop characteristics of whole spot position control

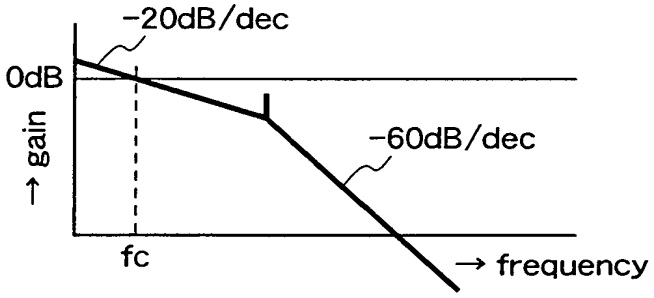


Fig.18 (a)

open-loop gain characteristics without spot position loop filter 111

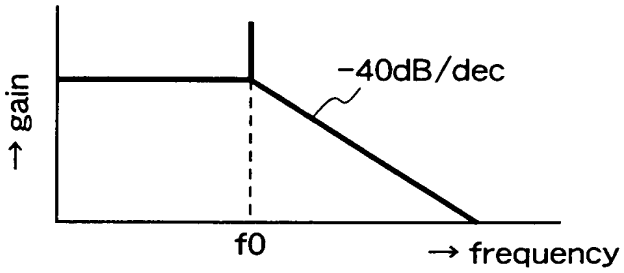


Fig.18 (b)

gain characteristics of spot position loop filter 111

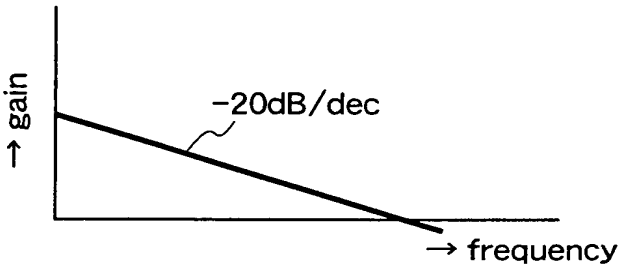


Fig.18 (c)

open-loop characteristics of whole spot position control

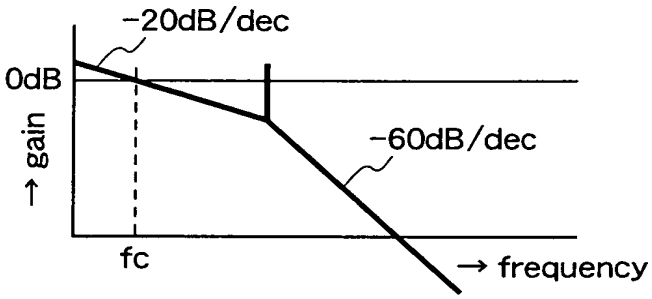


Fig.18 (d)

gain characteristics of changed spot position loop filter 111

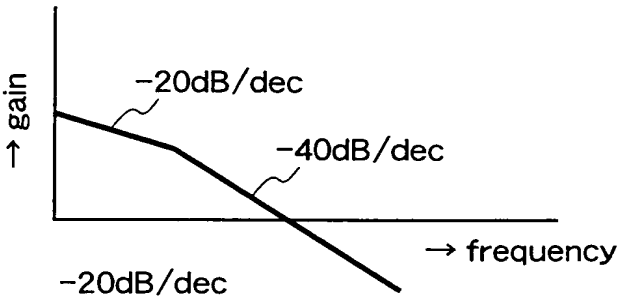


Fig.18 (e)

open-loop characteristics of whole changed spot position control

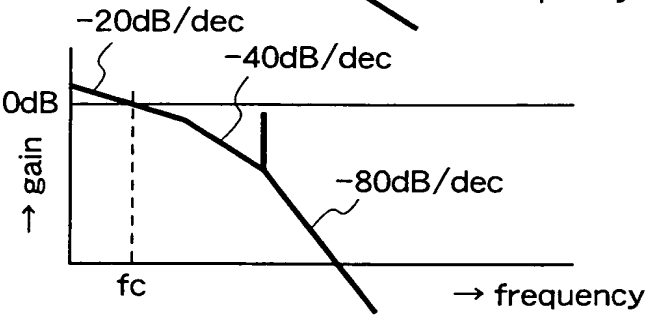


Fig.19 (a)
open-loop gain characteristics without spot position loop filter 111

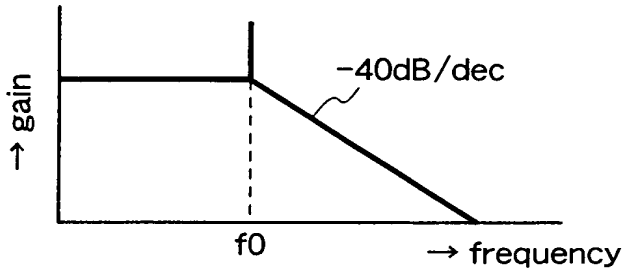


Fig.19 (b)
gain characteristics of spot position loop filter 111

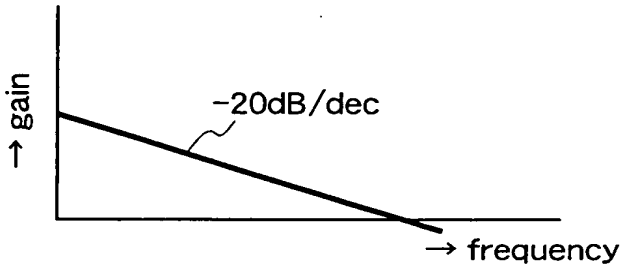


Fig.19 (c)
open-loop characteristics of whole spot position control

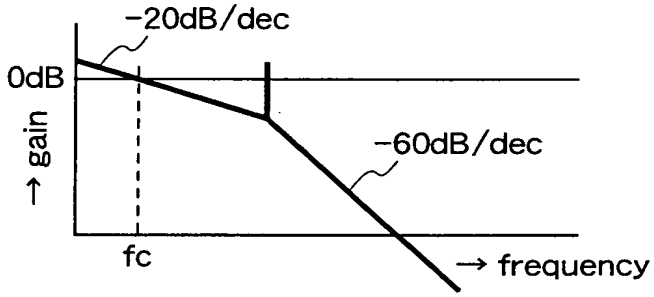


Fig.19 (d)
gain characteristics of spot position loop filter 111

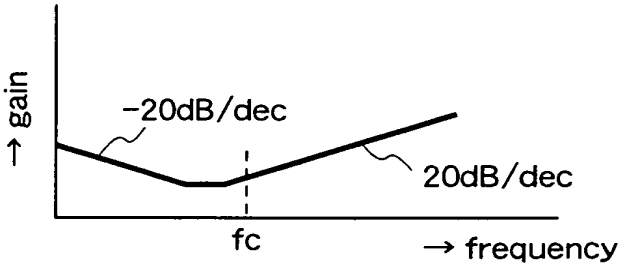


Fig.19 (e)
open-loop characteristics of whole spot position control

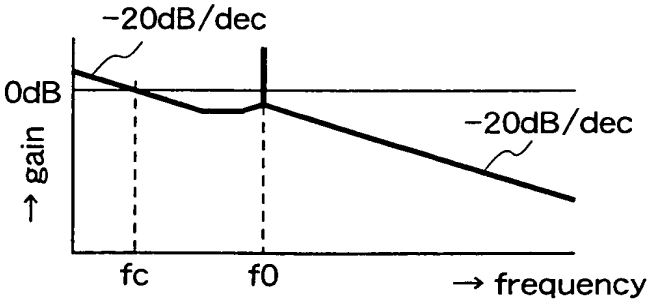


Fig.20 (a)
open-loop gain characteristics without spot position loop filter 111

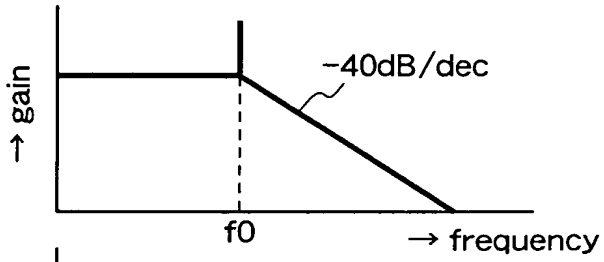


Fig.20 (b)
gain characteristics of spot position loop filter 111

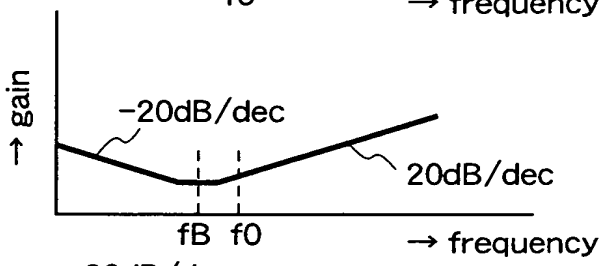


Fig.20 (c)
open-loop characteristics of whole spot position control

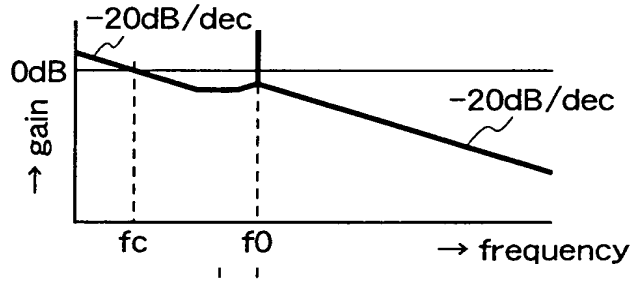


Fig.20 (d)
open-loop phase characteristics 181 witout spot position loop filter 111 and phase characteristics 182 of spot position loop filter 111

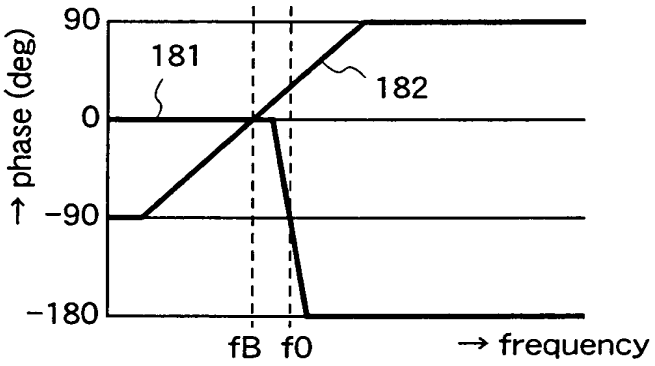
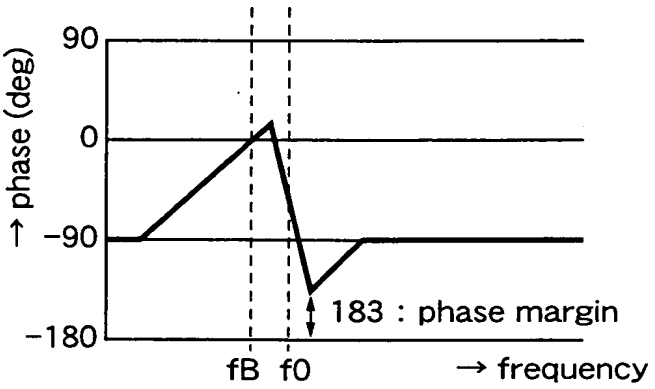



Fig.20 (e)
phase characteristics of whole spot position control